

MAILED

JUN 30 2022

June 30, 2022

Ryan Leland – Public Works Director

City of Helena

316 North Park Ave.

Helena, MT 59623

RE: Closed City of Helena Landfill – Groundwater Quality Data Validation/Statistical Evaluation and Groundwater Extraction System (GWES) Performance Reporting 2021 – Approval w/proposed 2022 GWES reduction of influence

Dear Mr. Leland:

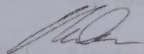
We have reviewed the reporting submitted by Hydrometrics and it meets the requirements of the Administrative Rules of Montana, Title 17, chapter 50, subchapter 13.

Historical detections of VOCs in downgradient monitoring wells continue to trend downward (PCE) or slightly upward (TCE). More recently, very low, yet detectable concentrations of cyanide associated with nearby remediation activities (MPC/Northwest Energy) and possible surface infiltrations (nitrates) continue to appear in downgradient wells. These three wells (HL-99-1,2 &3) are utilized for groundwater extraction/irrigation during spring and summer months near the Bill Roberts Golf Course. By design, the GWES continues to pull measurable masses of VOCs from the subsurface. Future GWES runtime reductions or complete well(s) extraction shutdowns could minimize its overall influence on upgradient constituents not associated with the former landfill or its current remedial goals.

I mentioned this idea to Hydrometrics last month and met with Jodi Bingham. It was agreed that shutting down extraction well HL-99-3, located furthest upstream and nearest to the cyanide source, could provide potentially useful data later when viewing the overall response to this shutdown. Conversely, shutting down extraction well HL-99-1, located furthest downstream, would inherently be least useful for initiating any noticeable response in the aquifer and/or cyanide data.

We will continue to work closely with Hydrometrics on this issue and report findings accordingly. The facility remains in corrective action with semi-annual groundwater monitoring. If you have any questions, please contact me.

Sincerely,



Mike Eder - Hydrogeologist

Solid Waste Program

Phone: 406-444-1434

Email: mike.eder@mt.gov

Program Email: deqswprogram@mt.gov

Cc: Mr. Pete Anderson, City of Helena, panderson@helenamt.gov
Ms. Jodi Bingham, P.E., Hydrometrics Inc., JBINGHAM@hydrometrics.com

File: Lewis & Clark (closed)/#90/groundwater monitoring & corrective action



MAILED
He 12/19/19

December 19, 2019

Eric Urban
Interim Public Works Director
City of Helena
316 North Park Ave
Helena, MT 59623

**RE: 2019 Annual Groundwater Extraction System Performance Report - Closed
City of Helena Landfill**

Dear Mr. Urban:

We have reviewed the report submitted by Hydrometrics, Inc. The landfill is compliant with treatment goals for the groundwater extraction and treatment systems.

If you have any questions, please contact me.

Sincerely,

Mike Eder
Hydrogeologist
Solid Waste Program
Phone: 406-444-1434
mike.eder@mt.gov

cc: Mr. Pete Anderson, City of Helena, 316 N Park Ave, Helena, MT 59623
Ms. Jodi Bingham, P.E., Hydrometrics Inc., 3020 Bozeman Ave, Helena, MT 59601

file: Lewis & Clark County/License #90/groundwater corrective measures

DEQ

Handwritten notes

Document ID: [illegible]

Section 1: [illegible]
Section 2: [illegible]
Section 3: [illegible]
Section 4: [illegible]
Section 5: [illegible]

Section 6: [illegible]
Section 7: [illegible]

Section 8: [illegible]

Section 9: [illegible]
Section 10: [illegible]

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Section 12: [illegible]

Section 13: [illegible]

Section 14: [illegible]

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Section 16: [illegible]

Section 17: [illegible]

Section 18: [illegible]
Section 19: [illegible]

Section 20: [illegible]



June 11, 2018

MAILED
JUN 11 2018

Mr. Randall Camp
City of Helena
City/County Building
316 North Park Avenue
Helena, MT 59623

RE: **CLOSED CITY OF HELENA CLASS II LANDFILL- LICENSE #90**
DATA VALIDATION AND STATISTICAL EVALUATION OF DECEMBER 2017 GROUNDWATER DATA

Dear Mr. Camp:

We have reviewed the report and it meets the requirements of the Administrative Rules of Montana Title 17, Chapter 50, Subchapter 13.

The facility remains in corrective action with semi-annual monitoring at this time. If you have any questions please contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "John B. Collins", is written over a horizontal line.

John Collins
Hydrogeologist
Solid Waste Program
Phone: 406-444-2802, Fax: 406-444-1374
E-mail: jcollins3@mt.gov

cc: Ms. Jodi Bingham, Hydrometrics, Inc., 3020 Bozeman Ave., Helena, MT 59601

Correspondence Slip

Originator: JK

Date Requested: 6-6-18

Date Needed By: 6-11-18

REVIEW
ROUTING

Name

Task

Initial/Date

SARA NELSON

Proof

SN, 6/7

RT

RT, 6-7-2018

Mail original via:

☒ Regular ☐ Certified ☐ Registered ☐ FedEx

Fax to addressee at:

Proof Path: G:\WUT\

Mail copy of enclosures
to CC's? Y ☒ N

Special Instructions:

Copies of enclosures
for file needed? Y ☒ N

Copy of letter for file
needed? Y ☒ N

Email copies sent? Y N

EMAIL copy sent to Project Originator? Y N





March 22, 2018

MAILED
MAR 22 2018

Mr. Randall Camp
Public Works Director
City of Helena
316 North Park Avenue
Helena, MT 59623

**RE: CLOSED CITY OF HELENA LANDFILL – LEWIS AND CLARK COUNTY – LICENSE #90
2017 ANNUAL LANDFILL GAS EXTRACTION SYSTEM PERFORMANCE REPORT**

Dear Mr. Camp:

We have reviewed the report, and it indicates the landfill gas extraction system is operating as designed and has removed significant quantities of Volatile Organic Compounds. The additional passive interceptor trench, just to the north of Lyndale Avenue, also appears to be operating as designed and has dramatically reduced the high methane concentrations that were observed in that area of the old landfill.

If you have any questions please contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "John Collins", is written over a horizontal line.

John Collins
Hydrogeologist
Solid Waste Program
Phone: 406-444-2802, Fax: 406-444-1374
E-mail: jcollins3@mt.gov

cc: Mr. Pete Anderson, City of Helena, 316 N Park Ave, Helena, MT 59623
Ms. Jodi Bingham, P.E., Hydrometrics, Inc., 3020 Bozeman Ave., Helena, MT 59601

Correspondence Slip

Originator: JL

Date Requested: 3/19/18

Date Needed By: 3/22/18

REVIEW
ROUTING

Name

Task

Initial/Date

SARA NELSEN

Proof

SNL 3/19

MLH

RT

MLH 3/19
3-20-18

Mail original via:

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Special Instructions:

Mail copy of enclosures
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Copies of enclosures
for file needed? Y ☒ N

Copy of letter for file
needed? Y ☒ N

Email copies sent? Y N

EMAIL copy sent to Project Originator? Y N

Correspondence file

Case Number

File Number

ORIGINAL

Name

Address

Initials

John Wilson

123 Main St

W. J. Wilson

123

123

3-28-18

By Special Agent in Charge

Signature

Special Instructions

Copy of this report
to be made by
Special Agent in Charge
of the
Department of Justice
and
to be
sent to
the
proper
authorities
for
their
action.



February 23, 2018

MAILED
FEB 26 2018

Mr. Pete Anderson
City of Helena
316 N Park Ave
Helena, MT 59623

**RE: CLOSED CITY OF HELENA CLASS II LANDFILL – LEWIS AND CLARK COUNTY –
LICENSE #90
2017 ANNUAL GROUNDWATER EXTRACTION SYSTEM PERFORMANCE REPORT**

Dear Mr. Anderson:

The annual report has been reviewed. This report demonstrates that the contaminated water removed by the three extraction wells, HL-99-1, HL-99-2, and HL-99-3, is being treated to below the required limits prior to land application at the golf course.

If you have any questions or comments please contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "John Collins", is written over a faint, circular official stamp.

John Collins
Hydrogeologist
Solid Waste Program
Phone: 406-444-2802, Fax: 406-444-1374
E-mail: jcollins3@mt.gov

cc: Ms. Jodi Bingham, Hydrometrics, Inc., 3020 Bozeman Ave., Helena, MT 59601

Correspondence Slip

Date Requested: 2-21-18Originator: JCDate Needed By: 2-23-18REVIEW
ROUTING

Name

Task

Initial/Date

SARA NELSENProofSN, 2/22mttmtt, 2-23RTRT, 2-23-18/

Mail original via:

☒ Regular ☐ Certified ☐ Registered ☐ FedEx

Fax to addressee at:

Proof Path: G:\WUT_____

Special Instructions:

Mail copy of enclosures
to CC's? Y ☒ NCopies of enclosures
for file needed? Y ☒ NCopy of letter for file
needed? ☒ Y ☐ N

Email copies sent? Y N

EMAIL copy sent to Project Originator? Y ☒ N



March 3, 2017

MAILED
3-6-17 sn

Mr. Randall Camp
Public Works Director
City of Helena
316 North Park Avenue
Helena, MT 59623

**RE: CLOSED CITY OF HELENA LANDFILL – LEWIS AND CLARK COUNTY – LICENSE #90
2016 ANNUAL LANDFILL GAS EXTRACTION SYSTEM PERFORMANCE REPORT**

Dear Mr. Camp:

The 2016 Annual Landfill Gas Extraction System Performance Report for the closed City of Helena Landfill in Lewis and Clark County, Montana has been reviewed. The report indicates the landfill gas extraction system is operating as designed and has removed significant quantities of Volatile Organic Compounds. The installation of the additional passive interceptor trench, just to the north of Lyndale Avenue, also appears to be operating as designed and has dramatically reduced the high methane concentrations that were observed in that area of the old landfill.

If you have any questions or comments regarding this review, please contact me.

Sincerely,

John Collins
Hydrogeologist
Solid Waste Program
Phone: 406-444-2802, Fax: 406-444-1374
E-mail: jcollins3@mt.gov

cc: Mr. Pete Anderson, City of Helena, 316 N Park Ave, Helena, MT 59623
Mr. Matt Culpo, P.E., City of Helena, 316 N Park Ave, Helena, MT 59623
Ms. Jodi Bingham, P.E., Hydrometrics, Inc., 3020 Bozeman Ave., Helena, MT 59601

DEC 1 1991

MAILED

2-1-92

March 1, 1992

Mr. Randall
Public Works Bureau
City of Boston
100 South Street
Boston, MA 02109

Re: Construction of the new City of Boston Police Station - 100 South Street, Boston, MA 02109

Dear Mr. Randall:

The City of Boston is pleased to announce that the new City of Boston Police Station, located at 100 South Street, Boston, MA 02109, is now open for business. The new station is a state-of-the-art facility that will provide a more efficient and effective environment for the City's police officers. The station is located in a prime location and is easily accessible to the public. The new station is a testament to the City's commitment to providing the best possible service to its citizens.

If you have any questions or comments regarding this notice, please contact me.

Sincerely,

John Collins

John Collins
City of Boston
Public Works Bureau
100 South Street
Boston, MA 02109

cc: Mr. John Collins, City of Boston, 100 South Street, Boston, MA 02109
Mr. John Collins, City of Boston, 100 South Street, Boston, MA 02109
Mr. John Collins, City of Boston, 100 South Street, Boston, MA 02109

Correspondence Slip

Originator:

JL

Date Requested:

3-1-17

Date Needed By:

3-3-17

REVIEW
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Name

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RT, 3-6-17

Mail original via:

☒ Regular ☐ Certified ☐ Registered ☐ FedEx

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Special Instructions:

Mail copy of enclosures
to CC's? Y ☒ N

Copies of enclosures
for file needed? Y ☒ N

Copy of letter for file
needed? Y ☒ N

Email copies sent? Y N

EMAIL copy sent to Project Originator? Y N



The first part of the document
 discusses the importance of
 maintaining accurate records
 and the role of the
 committee in this regard.
 It also mentions the
 need for regular
 communication and
 collaboration between
 all members of the
 organization.

In the second part, the
 document outlines the
 specific tasks and
 responsibilities of the
 committee members.
 This includes the
 preparation of reports,
 the organization of
 meetings, and the
 implementation of
 the organization's
 policies and
 procedures.



MAILED
2-6-17 SN

February 3, 2017

Mr. Pete Anderson
City of Helena
316 N Park Ave
Helena, MT 59623

**RE: CLOSED CITY OF HELENA CLASS II LANDFILL – LEWIS AND CLARK COUNTY –
LICENSE #90
2016 ANNUAL GROUNDWATER EXTRACTION SYSTEM PERFORMANCE REPORT**

Dear Mr. Anderson:

The October 2016 "Annual Groundwater Extraction System Performance Report" for the closed City of Helena Class II Landfill has been reviewed. This report demonstrates that the contaminated water removed by the three extraction wells, HL-99-1, HL-99-2, and HL-99-3, is being treated to below the required limits prior to land application at the golf course.

If you have any questions or comments regarding this review, please contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "John Collins", is written over a faint, circular official stamp.

John Collins
Hydrogeologist
Solid Waste Program
Phone: 406-444-2802, Fax: 406-444-1374
E-mail: jcollins3@mt.gov

cc: Ms. Jodi Bingham, Hydrometrics, Inc., 3020 Bozeman Ave., Helena, MT 59601

Correspondence Slip

Date Requested:

1/31/17

Originator:

JC

Date Needed By:

2/3/17

REVIEW
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Name

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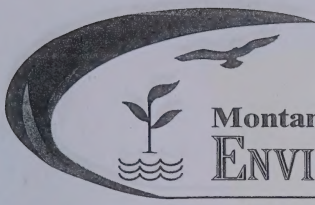
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needed? ☒ Y N

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Montana Department of
ENVIRONMENTAL QUALITY

MAILED
11-27-13 JH

Steve Bullock, Governor
Tracy Stone-Manning, Director

P. O. Box 200901 • Helena, MT 59620-0901 • (406) 444-2544 • Website: www.deq.mt.gov

November 26, 2013

Mr. Pete Anderson
City of Helena
316 N. Park Avenue
Helena, MT 59623

**RE: CLOSED CITY OF HELENA CLASS II LANDFILL – LEWIS AND CLARK COUNTY – LICENSE #90
2013 ANNUAL GROUNDWATER EXTRACTION SYSTEM PERFORMANCE REPORT**

Dear Mr. Anderson:

I have reviewed the October 2013 “Annual Groundwater Extraction System Performance Report” for the closed City of Helena Class II Landfill in Lewis and Clark County, Montana. This report demonstrates that the contaminated water removed by the three extraction wells, HL-99-1, HL-99-2, and HL-99-3, is being treated to below the required limits prior to land application at the golf course.

If you have any questions or comments regarding this review, please contact me.

Sincerely,

John Collins
Environmental Science Specialist
Solid Waste Program
Phone: 406-444-2802, Fax: 406-444-1374
E-mail: jcollins3@mt.gov

cc: Ms. Jodi Bingham, Hydrometrics, Inc., 3020 Bozeman Ave., Helena, MT 59601

File: Closed\Lewis and Clark Co.\City of Helena Class II Landfill\License #90\GW Corrective Measures

Correspondence Slip

Date requested: 11/22/13

Originator: JC

Date Needed By: _____

REVIEW
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Name

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review

Jh 11-22

Bm

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mdH 11-25

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PT 11-22-13

KT 11-26-13

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Mail copy of enclosures
to CC's? ☒ Y ☐ N

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Copy of letter for file
needed? ☒ Y ☐ N

Email copies sent? Y N

EMAIL copy sent to Project Originator? Y N



MAILED

2-1-13 Jh

"Healthy environment, healthy people"

**Montana Department of
ENVIRONMENTAL QUALITY**

Steve Bullock, Governor
Tracy Stone-Manning, Director

P. O. Box 200901 • Helena, MT 59620-0901 • (406) 444-2544 • Website: www.deq.mt.gov

January 28, 2013

Mr. Pete Anderson
City of Helena
316 N. Park Avenue
Helena, MT 59623

**RE: CLOSED CITY OF HELENA CLASS II LANDFILL – LEWIS AND CLARK COUNTY – LICENSE #90
2012 ANNUAL GROUNDWATER EXTRACTION SYSTEM PERFORMANCE REPORT**

Dear Mr. Anderson:

I have reviewed the November 2012 "Annual Groundwater Extraction System Performance Report" for the closed City of Helena Class II Landfill in Lewis and Clark County, Montana. This report demonstrates that the contaminated water removed by the three extraction wells, HL-99-1, HL-99-2, and HL-99-3, is being treated to below the required limits prior to land application at the golf course.

If you have any questions or comments regarding this review, please contact me.

Sincerely,

Martin Van Oort
Environmental Science Specialist
Solid Waste Program
Phone: 406-444-2802, Fax: 406-444-1374
E-mail: mvanoort@mt.gov

cc: Ms. Jodi Bingham, Hydrometrics, Inc., 3020 Bozeman Ave., Helena, MT 59601

File: Closed\Lewis and Clark Co.\City of Helena Class II Landfill\License #90\GW Corrective Measures

Correspondence Slip

Date Requested: 1/24/13

Originator: MVO

Date Needed By: 1/28/13

REVIEW
ROUTING

Name

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Initial/Date

Admin

Proof

JH 1-24

Mary H

Review

Mick 1-24

Bruce

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SN 1-28-13

Rock

RT 1-28-13

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Fax to addressee at:

Proof Path: G:\WUT_____

Mail copy of enclosures to CC's? Y ☒ N

Special Instructions:

Copies of enclosures for file needed? Y ☒ N

Copy of letter for file needed? ☒ Y N

Email copies sent? Y ☒ N

EMAIL copy sent to Project Originator? Y N

County L&C

Facility & # 90

Closure

Landfarm

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GW Corr Meas

Methane

GW Monitoring

O & M

GW Reports

Run-on

Inspections

Other: closed files



Hydrometrics, Inc.
consulting scientists and engineers

3020 Bozeman Avenue
Helena, MT 59601
(406) 443-4150
Fax: (406) 443-4155
www.hydrometrics.com

RECEIVED

OCT 31 2019

Dept. of Enviro. Quality
Waste & Underground
Tank Management Bureau

October 29, 2019

Mr. Mike Eder
Hydrogeologist
Waste & Underground Tank Management Bureau
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

RE: Helena Landfill Groundwater Extraction System Performance Report,
License #SW-0090

Dear Mike,

On behalf of the City of Helena, I am submitted the annual groundwater extraction system performance report for your review.

If you have any questions concerning this report, please don't hesitate to call.

Sincerely,

Jodi Bingham, P.E.
Environmental Engineer/Chemist

Attachment

c: Ryan Leland, Interim City of Helena Public Works Director
Pete Anderson, City of Helena Solid Waste Supervisor

County Lewis & Clark

Facility & # 90

Closure Landfarm

Finan Assur Liner

GW Corr Meas Methane

GW Monitoring O & M

GW Reports Run-on

Inspections

Other: _____



Hydrometrics, Inc.

consulting scientists and engineers

3020 Bozeman Avenue
Helena, MT 59601
(406) 443-4150
Fax: (406) 443-4155
www.hydrometrics.com

May 14, 2019

Mr. John Collins
Environmental Science Specialist
Solid Waste Regulatory Program
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

RECEIVED *mjm*

MAY 15 2019

Dept. of Enviro. Quality
Waste & Underground
Tank Management Bureau

RE: Semiannual Groundwater Monitoring at City of Helena Landfill, License No. SW-0090

Dear John,

Enclosed for your review are the proposed monitoring sites and analytical schedule for the June 2019 semiannual groundwater monitoring at the Helena Landfill. Water level measurements will be obtained from additional monitoring wells to ensure an accurate potentiometric surface map can be established. This sampling regime is as listed in the approved Revised Sampling and Analysis Plan, City of Helena Landfill, Groundwater, Surface Water, and Landfill Gas Monitoring Activities (Hydrometrics, 2019). Sampling personnel will be attempting to sample the week of June 10th. Please call if you have any questions or comments.

Sincerely,

Jodi Bingham, P.E.
Environmental Engineer/Chemist

c: Randall Camp, City of Helena
Pete Anderson, City of Helena
Mike Wignot, Hydrometrics

MAY 15 2019

**HELENA LANDFILL
JUNE 2019 SAMPLE SITE AND PARAMETER LIST**

Dept. of Enviro. Quality
Waste & Underground
Tank Management Bureau

Site Name	Parameter
Monitoring Wells ⁽¹⁾	
INF. GALLERY	Table 1 VOC's only
MPC-2	Table 1 VOC's only
HL-90-2	Table 1
HL-94-1R	Table 1
HL-94-3	Table 1
HL-06-1	Table 1
HL-90-3	Table 1
HL-94-2R	Table 1
HL-99-1	Table 1
HL-99-2	Table 1
HL-10-1	Table 1
HL-99-3	Table 1
MPC-1	Table 1
I-4	Table 1 VOC's only
EPA-1	Table 1
MPC-5	Table 1
Residential Wells:	
5	Table 1 VOC's only
16	Table 1 VOC's only
40	Table 1 VOC's only
48	Table 1 VOC's only
57	Table 1 VOC's only
62	Table 1 VOC's only
90	Table 1 VOC's only
Bridger Vet	Table 1 VOC's only
Quality Control:	
Duplicate (HL-90-3)	Table 1
D.I. Blank	Table 1
Trip Blank	Table 1
Rinseate Blank	Table 1

(1) Monitoring wells are listed in the order to be sampled.

County Lehigh & Clark

Facility & # 90

Closure

Landfarm

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GW Monitoring

O & M

GW Reports

Run-on

Inspections

Other: _____



Hydrometrics, Inc.
consulting scientists and engineers

3020 Bozeman Avenue
Helena, MT 59601
(406) 443-4150
Fax: (406) 443-4155
www.hydrometrics.com

April 4, 2019

Mr. John Collins
Environmental Science Specialist
Solid Waste Regulatory Program
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

B1 RECEIVED

APR 08 2019

Dept. of Enviro. Quality
Waste & Underground
Tank Management Bureau

GW

RE: Revised Sampling and Analysis Plan City of Helena Landfill, License #SW-0090

Dear John,

On behalf of the City of Helena, Hydrometrics has revised the Sampling and Analysis Plan for the City of Helena Landfill to reflect the current sampling sites, schedules and protocols employed for this project. After receiving approval from Pete Anderson of the City of Helena, I am forwarding a copy of the report "Revised Sampling and Analysis Plan City of Helena Landfill Groundwater, Surface Water, and Landfill Gas Monitoring Activities" for your review.

If you have any questions concerning this report, please don't hesitate to call.

Sincerely,

Jodi Bingham, P.E.
Environmental Engineer/Chemist

Enclosure

- c: Randall Camp, City of Helena, without Enclosure
Pete Anderson, City of Helena, without Enclosure
Mike Wignot, Hydrometrics, without Enclosure

County Lewis & Clark

Facility & # 90

Closure Landfarm

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GW Corr Meas Methane

GW Monitoring O & M

GW Reports Run-on

Inspections

Other: _____



Hydrometrics, Inc.

consulting scientists and engineers

3020 Bozeman Avenue
Helena, MT 59601
(406) 443-4150
Fax: (406) 443-4155
www.hydrometrics.com

May 24, 2018

Mr. John Collins
Environmental Science Specialist
Solid Waste Regulatory Program
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

#90
RECEIVED

MAY 25 2018

Dept. of Enviro. Quality
Waste & Underground
Tank Management Bureau

Dear John,

Enclosed for your review are the proposed monitoring sites and analytical schedule for the June 2018 semiannual groundwater monitoring at the Helena Landfill. Water level measurements will be obtained from additional monitoring wells to ensure an accurate potentiometric surface map can be established. This sampling regime is as listed in the approved Revised Sampling and Analysis Plan, City of Helena Landfill, Groundwater, Surface Water, and Landfill Gas Monitoring Activities (Hydrometrics, 2008). Sampling personnel will be attempting to sample the week of June 25th. Please call if you have any questions or comments.

Sincerely,

Jodi Bingham, P.E.
Environmental Engineer/Chemist

c: Randall Camp, City of Helena
Pete Anderson, City of Helena
Mike Wignot, Hydrometrics

**HELENA LANDFILL
JUNE 2018 SAMPLE SITE AND PARAMETER LIST**

Site Name	Parameter
Monitoring Wells ⁽¹⁾	
INF. GALLERY	Table 1 VOC's only
MPC-2	Table 1 VOC's only
HL-90-2	Table 1
HL-94-1R	Table 1
HL-94-3	Table 1
HL-06-1	Table 1
HL-90-3	Table 1
HL-94-2R	Table 1
HL-99-1	Table 1
HL-99-2	Table 1
HL-10-1	Table 1
HL-99-3	Table 1
MPC-1	Table 1
I-4	Table 1 VOC's only
EPA-1	Table 1
MPC-5	Table 1
Residential Wells:	
5	Table 1 VOC's only
16	Table 1 VOC's only
40	Table 1 VOC's only
48	Table 1 VOC's only
57	Table 1 VOC's only
62	Table 1 VOC's only
90	Table 1 VOC's only
Bridger Vet	Table 1 VOC's only
Quality Control:	
Duplicate (HL-90-3)	Table 1
D.I. Blank	Table 1
Trip Blank	Table 1
Rinseate Blank	Table 1

(1) Monitoring wells are listed in the order to be sampled.

County

Lewis & Clark

Facility & #

90

Closure

Landfarm

Finan Assur

Liner

GW Corr Meas

Methane

GW Monitoring

O & M

GW Reports

Run-on

Inspections

Other:



Hydrometrics, Inc.

consulting scientists and engineers

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Helena, MT 59601
(406) 443-4150
Fax: (406) 443-4155
www.hydrometrics.com

February 27, 2018

RECEIVED
MAR 01 2018
Dept. of Enviro. Quality
Waste & Underground
Tank Management Bureau

Mr. John Collins
Environmental Science Specialist
Solid Waste Regulatory Program
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

RE: Statistical Evaluation of December 2017 Groundwater Quality Data at City of Helena
Landfill, License #SW-0090

Dear John,

On behalf of the City of Helena, Hydrometrics validated and statistically evaluated groundwater quality data for samples collected at the City's municipal landfill in December 2017. After receiving approval from Pete Anderson of the City of Helena, I am forwarding a copy of the report "Data Validation and Statistical Evaluation of December 2017 Groundwater Quality Data City of Helena Landfill" for your review.

If you have any questions concerning this report, please don't hesitate to call.

Sincerely,

Jodi Bingham, P.E.
Environmental Engineer/Chemist

Enclosure

- c: Randall Camp, City of Helena, without Enclosure
Pete Anderson, City of Helena, without Enclosure
Mike Wignot, Hydrometrics, without Enclosure

County Lewis & Clark

Facility & # 90

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November 1, 2017

Mr. John Collins
Environmental Science Specialist
Solid Waste Regulatory Program
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

RECEIVED

NOV 03 2017

Dept. of Enviro. Quality
Waste & Underground
Tank Management Bureau

RE: Helena Landfill Groundwater Extraction System Performance Report
License #SW-0090

Dear John,

On behalf of the City of Helena, I am submitting the annual groundwater extraction system performance report for the City of Helena Landfill, plant ID 049 0014. The groundwater extraction system was installed in the spring of 2000 and is located just north of the landfill boundary. This treatment system includes three extraction wells (HL-99-1, HL-99-2, and HL-99-3) to intercept tetrachloroethene (PCE) impacted groundwater migrating downgradient of the landfill. The extracted groundwater is pumped through aeration nozzles into two lined ponds located on Bill Roberts Golf Course. In accordance with regulations, the treated water is sampled monthly to ensure the treatment goals have been met in conjunction with land application on the golf course.

The groundwater extraction system operated May 9, 2017 through October 22, 2017 for a total of 160 days. The batteries in the flowmeter displays were replaced in all three extraction wells during calibration of the system on May 11, 2017. The pump in HL-99-2 failed to automatically restart after a power outage in August; according to the hour meter, the pump was down for just over 28 days before the pump was manually restarted. Hydrometrics' personnel winterized the extraction system after the system was shut down on October 22th. Several tables showing all the data collected at the groundwater extraction system over the last year and calculations performed with that data are included as Attachment A to this report. A summary of the operational data is shown in Table 1. With a combined average flow of 62.8 gpm from the three extraction wells, a total of 13.7 million gallons of groundwater was extracted and treated this year.

Groundwater samples were collected in December 2016 and June 2017 from each of the extraction wells. The field book notes, sampling forms and lab reports for this sampling were included in the December 2016 and June 2017 data validation reports you have already received. Table 2 includes a summary of the sample results. Only those parameters that

were detected in at least one extraction well during the December 2016 or June 2017 sampling events were included. Assuming a conservative treatment level of 0.00025 mg/L for each compound and the total volume pumped for each well, the estimated mass of volatile organic compounds (VOCs) removed from each well was calculated. These values are also shown in Table 2.

TABLE 1. SUMMARY OF OPERATIONAL DATA

Extraction Well	Days Operated	Average Flowrate (gpm)	Total Volume Removed (gal)
HL-99-1	159.4	10.1	2,310,990
HL-99-2	130.9	16.5	3,112,489
HL-99-3	159.6	36.2	8,314,802
Total	160	62.8	13,738,281

TABLE 2. EXTRACTION WELL SAMPLE RESULTS AND MASS OF VOCs REMOVED

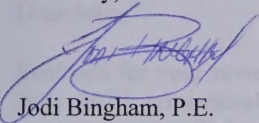
VOC	HL-99-1		HL-99-2		HL-99-3		Total	
	Average Conc. (mg/L)	Mass Removed (kg)	Average Conc. (mg/L)	Mass Removed (kg)	Average Conc. (mg/L)	Mass Removed (kg)	Average Conc. (mg/L)	Mass Removed (kg)
1,1-Dichloroethane	0.00088	0.0055	0.0030	0.0318	0.0030	0.0850	0.0023	0.1123
Chloroform	0.0015	0.0105	0.0015	0.0141	0.0023	0.0645	0.0017	0.0892
Cis-1,2-dichloroethane	0.0021	0.0162	0.0013	0.0128	0.0018	0.0488	0.0017	0.0777
Dichlorodifluoromethane	0.00062	0.0032	0.0013	0.0122	0.0011	0.0258	0.00099	0.0412
Methylene chloride	<0.0005	0.0000	<0.0005	0.0000	0.00055	0.0094	.00052	0.0094
Tetrachloroethene (PCE)	0.0038	0.0311	0.0055	0.0318	0.0088	0.2691	0.0060	0.3620
Trichloroethene (TCE)	0.0011	0.0070	0.0013	0.0128	0.0017	0.0456	0.0014	0.0654
Total Mass Removed		0.0734		0.146		0.548		0.767

The sample results from the extraction wells indicate that the average PCE concentration being extracted from the system is 0.0060 mg/L for a total mass of PCE removed of 0.36 kg. The total mass of VOCs removed by the groundwater extraction system during the 2017 irrigation season was 0.77 kg.

During system operation, surface water samples were collected on a monthly basis from the golf course sprinkler system. These water quality samples ensure that treatment goals are met. In addition, a single sample was collected from the east golf course pond during the June sampling event. The field book notes and lab reports for each of these sampling events has been included as Attachment B to this report. The results from the monthly sampling events indicate that all VOCs were below their respective laboratory detection limits prior to land application at the golf course.

If you have any questions concerning this data or need any additional information to complete your files, please do not hesitate to call me at 443-4150, Ext. 172.

Sincerely,



Jodi Bingham, P.E.
Environmental Engineer/Chemist

c: Randall Camp, City of Helena Public Works Director (w/attachments)
Pete Anderson, City of Helena Solid Waste Supervisor (w/attachments)
Mike Wignot, Hydrometrics, Inc. (w/out attachments)

County Lewis & Clark

Facility & # 90

Closure Landfarm

Finan Assur Liner

GW Corr Meas Methane

GW Monitoring O & M

GW Reports Run-on

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Other: _____



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May 9, 2017

Mr. John Collins
Environmental Science Specialist
Solid Waste Regulatory Program
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

#90

RECEIVED

MAY 10 2017

Dept. of Enviro. Quality
Waste & Undergr.
Tank Management Bureau

Dear John,

Enclosed for your review are the proposed monitoring sites and analytical schedule for the June 2017 semiannual groundwater monitoring at the Helena Landfill. Water level measurements will be obtained from additional monitoring wells to ensure an accurate potentiometric surface map can be established. This sampling regime is as listed in the approved Revised Sampling and Analysis Plan, City of Helena Landfill, Groundwater, Surface Water, and Landfill Gas Monitoring Activities (Hydrometrics, 2008). Sampling personnel will be attempting to sample the week of June 5, 2017. Please call if you have any questions or comments.

Sincerely,

Jodi Bingham, P.E.
Environmental Engineer/Chemist

c: Randall Camp, City of Helena
Pete Anderson, City of Helena
Mike Wignot, Hydrometrics

**HELENA LANDFILL
JUNE 2017 SAMPLE SITE AND PARAMETER LIST**

Site Name	Parameter
Monitoring Wells ⁽¹⁾	
INF. GALLERY	Table 1 VOC's only
MPC-2	Table 1 VOC's only
HL-90-2	Table 1
HL-94-1R	Table 1
HL-94-3	Table 1
HL-06-1	Table 1
HL-90-3	Table 1
HL-94-2R	Table 1
HL-99-1	Table 1
HL-99-2	Table 1
HL-10-1	Table 1
HL-99-3	Table 1
MPC-1	Table 1
I-4	Table 1 VOC's only
EPA-1	Table 1
MPC-5	Table 1
Residential Wells:	
5	Table 1 VOC's only
16	Table 1 VOC's only
40	Table 1 VOC's only
48	Table 1 VOC's only
52	Table 1 VOC's only
57	Table 1 VOC's only
62	Table 1 VOC's only
90	Table 1 VOC's only
Quality Control:	
Duplicate (HL-90-3)	Table 1
D.I. Blank	Table 1
Trip Blank	Table 1
Rinseate Blank	Table 1

(1) Monitoring wells are listed in the order to be sampled.

County Lewis & Clark

Facility & # 90

Closure Landfarm

Finan Assur Liner

GW Corr Meas Methane

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#90

September 5, 2017

Mr. John Collins
Environmental Science Specialist
Solid Waste Regulatory Program
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

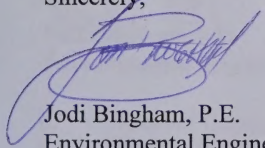
RE: Data Validation and Statistical Evaluation of June 2017 Groundwater Quality Data

Dear John,

On behalf of the City of Helena, Hydrometrics validated and statistically evaluated groundwater quality data for samples collected at the City's municipal landfill in June 2017. After receiving approval from Pete Anderson of the City of Helena, I am forwarding a copy of the report "Data Validation and Statistical Evaluation of June 2017 Groundwater Quality Data City of Helena Landfill" for your review.

If you have any questions concerning this report, please don't hesitate to call.

Sincerely,


Jodi Bingham, P.E.
Environmental Engineer/Chemist

Enclosure

c: Randall Camp, City of Helena, with Enclosure
Pete Anderson, City of Helena, with Enclosure
Mike Wignot, Hydrometrics, without Enclosure


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Dept. of Enviro. Quality
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November 17, 2015

Mr. John Collins
Environmental Science Specialist
Solid Waste Regulatory Program
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

RECEIVED
NOV 19 2015
DEPT. OF ENVIRO. QUALITY
WASTE & UNDERGROUND TANK
MANAGEMENT BUREAU

Dear John,

Enclosed for your review are the proposed monitoring sites and analytical schedule for the December 2015 semiannual groundwater monitoring at the Helena Landfill. Water level measurements will be obtained from several additional monitoring wells to ensure an accurate potentiometric surface map can be established. This sampling regime is as listed in the approved "Revised Sampling and Analysis Plan, City of Helena Landfill, Groundwater, Surface Water, and Landfill Gas Monitoring Activities" (Hydrometrics, 2008). Sampling personnel will be attempting to sample the week of December 14, 2015. Please call if you have any questions or comments.

Sincerely,

Jodi Bingham, P.E.
Environmental Engineer/Chemist

c: Randall Camp, City of Helena
Pete Anderson, City of Helena
Mike Wignot, Hydrometrics

**HELENA LANDFILL
DECEMBER 2015 SAMPLE SITE AND PARAMETER LIST**

Site Name	Parameter
Monitoring Wells ⁽¹⁾	
INF. GALLERY	Water level only
EPA-2	Water level only
EPA-4	Water level only
MPC-2	Water level only
HL-90-2	Water level only
HL-94-1R	Table 1
HL-94-3	Water level only
HL-06-1	Table 1
HL-90-3	Water level only
HL-94-2R	Water level only
I-1	Water level only
HL-99-1	Table 1
HL-99-2	Table 1
HL-90-1	Table 1
HL-10-1	Table 1
HL-99-3	Table 1
MPC-1	Water level only
EPA-1	Water level only
MPC-5	Table 1
Residential Wells:	
5	Table 1 VOC's only
16	Table 1 VOC's only
Quality Control:	
Duplicate (HL-10-1)	Table 1
DI Blank	Table 1
Trip Blank	Table 1
Rinsate Blank	Table 1

(1) Monitoring wells are listed in the order to be sampled.

